



# **InteliCoat Technologies**

## **Toxics Use Reduction Case Study**

### **Reduces Air Emissions by Adopting Solvent Free Coating Processes**

#### **Summary**

InteliCoat Technologies (formerly Rexam Image Products) achieved toxics use reduction by adopting solvent free coating processes for the manufacturing of about 60% of their product line. This included the development and commercialization of both water borne and 100% solids UV-cure coating technology. Since the mid-1990's, InteliCoat Technologies has invested over \$20 million on product/process development and production improvements to support this new coating technology. This investment has resulted in an 88% reduction of air emissions from volatile organic compounds (VOC) between the years 1990 and 2000. The savings from the reduction of raw materials are \$1.25 million per year.

#### **Background**

InteliCoat Technologies is headquartered in South Hadley, Massachusetts and employs 350 people. The company is a global leader in the manufacture of precision coated paper, film, and specialty substrates used in color digital imaging, electronic imaging and component manufacturing. Products manufactured at the South Hadley facility include a wide range of paper and film substrates used in large-format digital printing devices for display applications, film and paper for design engineering, and desktop media.

Prior to the 1980's, InteliCoat Technologies utilized a solvent coating manufacturing process almost exclusively for the production of coated paper, film, and other image media. This process involves mixing and applying a solvent-based coating to the surface of a web, then drying or flashing off the carrier solvent to leave the residual dry coating on the web surface. Historically, coating solutions were predominantly solvent based to achieve the required mix solubility with in-house resins and dispersions, to accelerate the evaporation process, and to optimize drying, which in turn resulted in air emissions of VOCs.

InteliCoat Technologies made a strategic business decision in the late 1980's to invest resources into the research and development of water-based coating technology for the manufacture of their new products. During the mid-1990's, due to increasing emphasis on environmental, health and safety protection and the rising cost of solvent, InteliCoat Technologies began increased efforts to explore alternative technologies for the application of the coating material.

#### **Toxics Use Reduction**

InteliCoat Technologies explored two separate technologies to reduce solvent usage. The first technology was water-based coatings, which are very similar to solvent-based coatings except water is utilized as the carrier and results in no VOC emissions when the surface of the coated web is dried.

The second technology was UV curable coatings. These coatings are unlike solvent or water based coatings in that they are largely 100% solids and do not require a carrier solution for application to the web. There are three main components that make up UV curable coatings: liquid oligomers, liquid monomers, and photoinitiators.

This process is fast and involves applying the coating to the web and passing it under a UV light, where the photoinitiators in the coating absorb the energy from the light and form “radicals”. This initiates the curing process as the radicals attach to the monomers and oligomers, typically creating a solid cross-linked stable network, and producing the desired coating properties on paper or film in a matter of seconds.

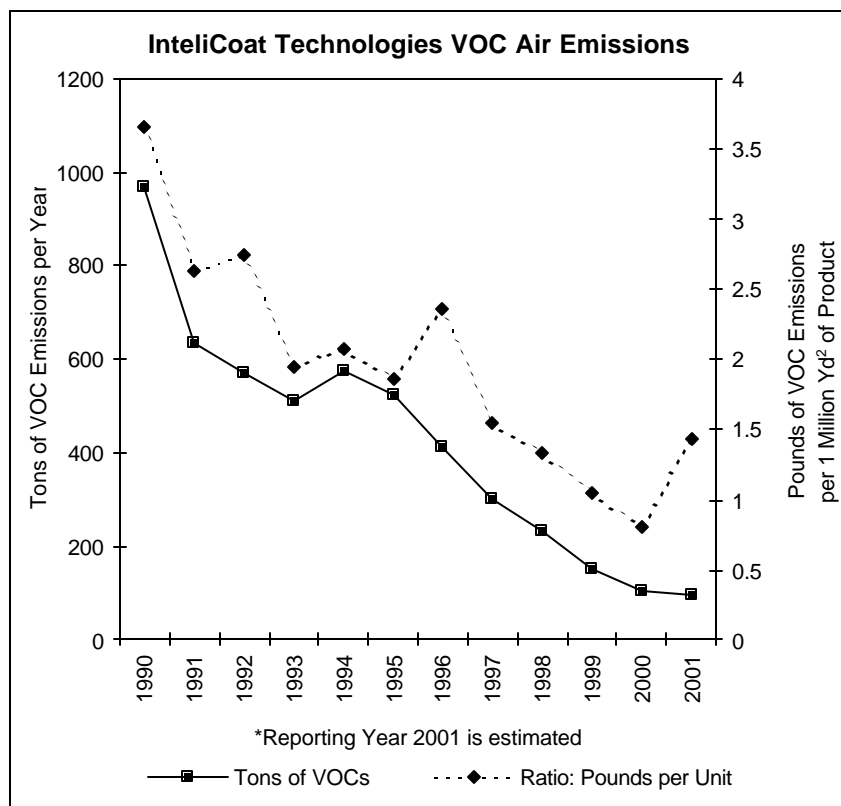
Since 1995, InteliCoat Technologies has integrated both water-based and UV cured technologies into 80% of all new products, for example the company’s use of an aqueous ceramic coating for components in the electronics industry. InteliCoat Technologies has continued to expand the development of water-based and UV cured technologies, as well as exploring other green chemistry technologies.

## Results

*Emissions:* The adoption of the solvent free coating processes resulted in significant environmental benefits. InteliCoat Technologies has achieved an 88% reduction in air emissions of volatile organic compounds since 1990, compared to their 2000 air emissions, and an approximate 98% reduction since 1979.

The adoption of solvent free coating has also directly reduced employees’ exposure to toxic solvents. Therefore, employee health and safety has improved through the substitution of “less hazardous” solvents and the reduction of flammable solvents. In the past decade, the company has improved community relations as a result of their green chemistry initiatives.

*Economics:* InteliCoat Technologies has experienced a dramatic cost savings as a direct result of using the solvent-free coating processes. The cost of raw materials was reduced by approximately \$1,250,000 per year. In addition, the waste disposal costs was reduced by approximately \$13,000 per year. There has also been recognition of InteliCoat Technologies’s environmental responsiveness in green chemistry commercialization (water borne coatings) by a major Original Equipment Manufacturer (OEM) customer. This recognition is both a positive measure of manufacturing performance and critical for sustaining and growing the business.



This case study is one in a series prepared by the Office of Technical Assistance (OTA), a branch of the Massachusetts Executive Office of Environmental Affairs. OTA's mission is to assist Massachusetts facilities with reducing their use of toxic chemicals and/or the generation of toxic manufacturing byproducts. Mention of any particular equipment or proprietary technology does not represent an endorsement of these products by the Commonwealth of Massachusetts. This information is available in alternate formats upon request. OTA's **nonregulatory** services are available at **no charge** to Massachusetts businesses and institutions that use toxics. For further information about this or other case studies, or about OTA's technical assistance services, contact:

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